

# Climate Change Impacts on Land for Development

A good practice guide for managing climate change geo-related impacts and liabilities



Project P3266  
Version Number 0.1



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## About CIRIA

CIRIA is the Construction Industry Research and Information Association, a neutral, independent and not-for-profit member organisation.

Our vision is to be the leading enabler and preferred partner for performance improvement, to drive collaboration across the built environment and construction sectors to research, develop and transfer knowledge.

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## CIRIA Products

CIRIA delivers robust, authoritative and independent good practice guidance applicable across sectors and designed for a range of users, from policy makers to practitioners.

Our guidance is developed collaboratively with industry and academic experts. Our methods ensure consensus, quality and the latest thinking underpin everything we do. Our work contains case studies to share knowledge and illustrate practice through examples.

We raise awareness of our good practice guidance through training, events, communities of practice, social media, blogs and press releases. Key messages from our projects are widely disseminated to help embed good practice into industry.

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## CIRIA Research Ambitions

CIRIA's 60+ year history and future purpose are aligned to our ambitions, designed to make a tangible difference to the sectors in which we work. We take a holistic, systems-based approach to critical industry challenges within our 5 core research ambitions.



Embedding  
Sustainability



Achieving Net  
Zero Carbon



Increasing  
Resilience



Improving  
Delivery



Harnessing  
Innovation

# Climate Change Impacts on Land Development

## Justification

Construction and the redevelopment sectors are vulnerable to the effects of climate change. Land use choices and below ground building and infrastructure design options can affect the delivery of both climate change mitigation and sustainable development, both key principles of the UK's Planning Policies. Societal concerns as evidenced by increasing climate change class action litigation, have aided in getting business' attention in these areas. Increasingly it is expected that Employer's Requirements and contract obligations will be imposed to help the UK's journey to 'Net Zero' with the implied risk of needing to repair failures to meet such requirements.

The Environment Agency (EA) has produced reports that estimate the flooding cost in the UK since 2007. From 2015 to 2016 flooding has costed England and Wales £1.6bn to the economy. Although these focused on acute damages to buildings, infrastructure, and emergency costs,

The cost of chronic damages particularly in land development can be significant too. For example, according to the ABI, 2018's extreme summer heatwave led to more than 10,000 households needing to claim for damage caused by subsidence, at a cost of more than £64 million. With the UK government investing heavily in infrastructure and housing developments, the problem is only going to get worse if it is not adequately considered in future design and construction.

These extreme weather events, in particular, may necessitate modifications to design to mitigate any impact on the long-term suitability and function of the development of both brownfield and greenfield sites from development to operational phases. Getting it wrong could be costly so what does good practice look like for geo-related assessments, design, and implementation for UK land developments?

## Proposal & Products

CIRIA plan to deliver a good practice guide summarising the key potential impacts as a result of climate change on the development sector. The guide will focus on environmental and geotechnical ground conditions and how these influence the future of resilient land development. It will evaluate the impacts and mitigation strategies for both brownfield and greenfield redevelopment over the expected life of the development.

## Scope

### Stage 1 - Understand the issue

- What are the major implications and risks of climate change and extreme weather events on environmental and geotechnical ground conditions for land development projects
- A summary of the current guidance, tools, and research that are available for UK sites
- How is the industry currently dealing with this risk? What are the benefits of current approaches and what could be improved?
- What additional work or guidance is needed to address gaps in the current approach

### Stage 2 Development of a good practice guide for managing climate change impacts on on-site development

- What information needs to be evaluated when developing the ground model
- How climate uncertainties are modeled to ensure a robust assessment of risk is undertaken. What data is evaluated?
- How current human health, controlled water, property, and ecological risk and ground risk assessment should be modified and how to plan and implement resilient and cost-effective development
- How can we ensure our approach and designs are climate resilient in the short and long term and sustainable?
- Provide good practice examples to demonstrate that development can be delivered and achieve long-term suitability and function against the uncertainties of climate change impacts.

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## Indicative Timeline



# Why invest in a CIRIA project?

The benefits to your company from contributing to our projects

## Our reputation

Our reputation in the industry is long established and widely recognised. The principles of quality, sustainability and collaboration have been a foundation for what we do for many years.

## Our downloads

Our Guidance is downloaded over 50,000 times per year



## Our reach

Our members and downloads span over 50 countries worldwide



The benefits of being involved in a CIRIA project are various:

- Deliver significant corporate value for modest levels of investment.
- Raise awareness of your corporate brand through logo on outputs and submission of case studies and content.
- Network with peers, clients and thought leaders in the sector.
- Get your message heard and influence industry direction.
- Demonstrate tangible leading contribution to improvement in the sector, fulfilling ESG goals
- Provide CPD for your staff, aiding routes to chartership and personal career growth
- Assist future work winning through involvement with industry leading good practice

# Want to know more?

## CIRIA Research



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